

# A MODEL FIRE/EMS AND EMERGENCY MANAGEMENT SYSTEM FOR LOUDOUN COUNTY, VIRGINIA

## TASK ONE: THE MODEL



VERSION 8  
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## Table of Contents

<b>1. EXECUTIVE SUMMARY</b>	<b>1</b>
1.1. The Model Design Process .....	1
1.2. The Loudoun County Proposed Model.....	2
1.2.1. The Vision.....	2
1.2.2. The Mission .....	2
1.2.3. Model Attributes.....	2
<b>2. BACKGROUND</b>	<b>3</b>
<b>3. EMSSTAR'S ROLE</b>	<b>4</b>
<b>4. MODEL DESIGN PROCESS</b>	<b>5</b>
4.1. Approach .....	5
4.2. Data Study and Review of the Literature.....	5
4.3. Interviews .....	5
4.4. Consideration of Various Models .....	5
4.4.1. The Current Loudoun County System.....	6
4.4.2. Hospital Based Model (Rescue Only) .....	6
4.4.3. Public-Utility Model.....	7
4.4.4. Private Model.....	7
4.4.5. County Owned and Operated Model.....	8
4.5. Assumptions Used In The Loudoun County Model Development .....	8
<b>5. THE LOUDOUN COUNTY PROPOSED MODEL</b>	<b>10</b>
5.1. The Vision.....	10
5.2. The Mission .....	10
5.3. Model Attributes.....	10
5.3.1. Regulation and Policy.....	11
5.3.2. Resource Management.....	11
5.3.3. Human Resources.....	11
5.3.4. Finance.....	12
5.3.5. Medical Direction .....	12
5.3.6. Medical Facilities .....	13
5.3.7. Trauma System .....	13
5.3.8. Communications.....	14
5.3.9. Response Performance.....	14
5.3.10. Data And Evaluation.....	15
5.3.11. Fire and EMS Operations and Transport .....	16

5.3.12. Public Information and Education.....	17
5.3.13. Fire Prevention .....	17
5.3.14. Training.....	18
5.3.15. Water Supply .....	19
5.3.16. Emergency Management .....	19
5.3.16.1. Specialized Services .....	19
5.3.16.1.1. Mass Casualty Incidents.....	19
5.3.16.1.2. Hazardous Materials .....	19
5.3.16.1.3. Search and Rescue .....	19
5.3.16.1.4. Terrorism/Weapons of Mass Destruction .....	20
5.3.16.2. External Agency Relationships .....	20
5.3.17. Integration.....	21
<b>6. ACTION REQUIRED</b>	<b>22</b>
<b>A. FEE FOR SERVICE ATTRIBUTE</b>	<b>23</b>
A.1 Fee for service Attribute .....	23
A.2 Model 1 .....	23
A.3 Model 2.....	24

## List of Tables

Table 1 – Differential Response Times.....	15
Table 2 – Model 1 - Primary BLS Response .....	24
Table 3 – Model 2 - Primary ALS Response .....	24

# 1. EXECUTIVE SUMMARY

Loudoun County is the third fastest growing county in the United States. This presents unique challenges to systems planners, especially since most of the growth is occurring in the eastern portions of the County, leaving the western portions pristine, historically significant and predominantly rural. Although the rapid growth of Loudoun County is projected to steadily migrate to western portions of the County over the next few years, that migration has just begun. Thus, while western Loudoun County is still very rural, it is changing rapidly. This rural nature limits the availability of financial and human resources to meet increased demand for many types of services, including emergency services. Additionally, changes in expectation for services and a decrease in volunteerism have placed more stress on the current emergency response systems.

The Loudoun County Board of Supervisors, recognizing the rapidly changing environment issued a request for services to hire a consultant to develop a model Fire/EMS and Emergency Management Plan for Loudoun County. The EMSSTAR Group, LLC (EMSSTAR) was awarded this contract on October 27, 2000.

EMSSTAR has the responsibility of assisting the County in developing a model Fire/EMS and Emergency Management system that will meet the needs of both residents and visitors in the County. EMSSTAR is charged with five specific tasks by the Board of Supervisors to accomplish this mission.

Task 1 is the development of a Fire/EMS and Emergency Management model for Loudoun County and is the foundation of the project. The model will drive the content of the remaining tasks. Therefore, it is essential that the County Board of Supervisors agree on the model before moving on to subsequent tasks.

## 1.1. THE MODEL DESIGN PROCESS

EMSSTAR used the expert panel approach to problem solving in developing the model and in doing so formulated a team of national experts in the field of Fire/EMS and Emergency Management. Team members have experience in various delivery types and are active practitioners in their home systems. The team members have experience in paid, volunteer, combination volunteer/paid, private, third service, government, rural, urban, and high performance systems in various parts of the country. The team conducted extensive reviews of massive amounts of data supplied by the County and conducted interviews with over 200 stakeholders. Additionally, public meetings were held with volunteers and various team members conducted on-site visits at volunteer organizations and participated by riding on calls.

The team considered various models that had some applicability to Loudoun County including hospital-based, private, public utility and county-based. In developing the model, EMSSTAR utilized over 20 assumptions based on data, interviews, history and tradition, system demands, growth predictions and various other indicators.

## 1.2. THE LOUDOUN COUNTY PROPOSED MODEL

### 1.2.1. THE VISION

The EMSSTAR vision for the Loudoun County Board of Supervisors is the provision of an integrated EMS, Fire and Emergency Management system to meet the needs of the citizens and visitors of Loudoun County. This integrated system will have as its foundation a combination of volunteer and career personnel working within predetermined performance standards and protocols. The design and implementation of this new entity will be based upon the foundation of existing resources and system data. The system will be dynamic, responsive, cost-effective and caring. It will be sensitive to the changing needs and explosive growth of Loudoun County and yet retain and strengthen the County's heritage and traditions of community service.

### 1.2.2. THE MISSION

The Mission of the Loudoun County Department of Fire, EMS and Emergency Management is the protection of life, property and the environment through the delivery of effective and efficient fire protection, emergency medical services and emergency preparedness programs.

### 1.2.3. MODEL ATTRIBUTES

The basic model will be a county Department of Fire/EMS and Emergency Management utilizing a combination of volunteer/career personnel, all complying with consistent, predetermined performance standards and protocols, and operating under a single responsible agency. The proposed Loudoun County Model is based on the appropriate development and utilization of system attributes or components. These attributes are universal in successful systems and include areas such as regulation and policy, resource management, human resources, finance, medical direction, medical facilities, trauma systems, communications, response performance, data and evaluation, operations and transport, public information and education, fire prevention, training, specialized services, etc. The attributes break the system down into components and allow system managers to ensure that all the appropriate pieces are in place to ensure maximum system performance and efficiency. For example, the regulation and policy component assures that authority exists to carry out the mission, authority is in place to manage the system and policies are in place to ensure uniform implementation. The various attributes are discussed in greater detail in the full report.

## 2. BACKGROUND

Loudoun County is the third fastest growing county in the United States. This presents unique challenges to systems planners, especially since the predominance of growth is occurring in the eastern portions of the County. Although the rapid growth of Loudoun County is projected to steadily migrate to western portions of the County over the next few years, it has just begun. While western Loudoun County is still very rural, it is changing rapidly. This rural nature limits the availability of financial and human resources to meet increased demand for many types of services, including emergency services. Add to that a change in expectation for services and a decrease in volunteerism and the result is that current emergency response systems have become stressed.

The Loudoun County Board of Supervisors, recognizing the rapidly changing environment sent out a request for services to hire a consultant to develop a model Fire/EMS and Emergency Management Plan for Loudoun County. EMSSTAR was awarded this contract on October 27, 2000.

### 3.EMSSTAR'S ROLE

EMSSTAR has the responsibility of assisting the County in developing a model Fire/EMS and Emergency Management system that will meet the needs of both residents and visitors in the County. EMSSTAR is charged with five specific tasks by the Board of Supervisors to accomplish this mission:

**Task 1**--Propose an efficient and effective Fire, EMS, and Emergency Management system model for Loudoun County;

**Task 2**--Recommend a service level appropriate for Loudoun County for each component;

**Task 3**--Benchmark the existing system components and costs to corresponding components of the proposed system at minimum, average and high service levels and the recommended level;

**Task 4**--Provide an implementation plan with estimated costs for each step. Each recommendation shall be prioritized and phased to allow for incremental service level improvements and include potential funding sources;

**Task 5**--Prepare a service plan based on directives provided by the Board of Supervisors, in compliance with the Loudoun County Service Plan instructions.

Task 1 is the foundation of the project. The model will drive the content of the remaining tasks. Therefore, it is essential that the County Board of Supervisors agree on the model before moving on to subsequent tasks. This report specifically addresses Task 1.

## 4. MODEL DESIGN PROCESS

### 4.1. APPROACH

EMSSTAR used the expert panel approach to problem solving and in doing so formulated a team of national experts in the field of Fire/EMS and Emergency Management. Team members have experience in various delivery types and are active practitioners in their home systems. The team members have experience in paid, volunteer, combination volunteer/paid, private, third service, government, rural, urban, and high performance systems in various parts of the country. Team members with emergency medical and fire science-specific or -related undergraduate and post-graduate degrees complement this experience. A careful balance of academic principles and realistic understandings of the challenges that fire, EMS, and emergency management face today were prioritized and deliberated in order to form the expert consensus represented in this and subsequent documents.

### 4.2. DATA STUDY AND REVIEW OF THE LITERATURE

EMSSTAR combined this vast knowledge and experience in system delivery with the current experience in Loudoun County. The team reviewed extensive documentation requested by EMSSTAR and provided by the County. This included a review and analysis of laws, rules and regulations, financial data, planning documents, standard operating procedures, service delivery organizations, performance data, and a computer analysis of data in the computerized assisted dispatch files.

### 4.3. INTERVIEWS

EMSSTAR, in coordination with Loudoun County, conducted on-site interviews with more than 200 stakeholders of the County system. Interviews were held with numerous Department of Fire and Rescue staff, County government staff, volunteers, town mayors, homeowners associations, Board of Supervisors members, Fire and Rescue Commission members, neighboring service providers, business and industry representative, including the Loudoun County Chamber of Commerce, and County Administrator's Office staff. In addition EMSSTAR staff have conducted several open public meetings with volunteer EMS and fire providers and have conducted many one-on-one interviews at field stations and during ride-a-longs. Public and system stakeholder input was also received via a project web site established for that purpose.

### 4.4. CONSIDERATION OF VARIOUS MODELS

EMSSTAR's experience with the evaluation, design, implementation and operation of emergency services identified that there is no clear consensus on the definition or



structure of a single emergency services “model.” Experts, when asked to define various models around the country, use different terminology, features, and attributes to describe their particular model. Terms used to describe models often include, paid/volunteer, fire based, public utility, third service, hospital based, private, primary service area, tiered response, open competition, subscription, mixed/combination, as well as many other regionally specific terms. None of these descriptors or “definitions” shares the same underpinnings and clearly mean different things to different people. There is no national agreement on what the ideal model should be. Local system configurations often evolve and are generally based on a historical progression of service delivery. Because of this unique system evolution process, some models that work in one part of the country or state may not work in another. Additionally, a cost recovery and revenue generation attribute is common for all models. A discussion of this fee for service attribute is contained in Appendix A.

EMSSTAR reviewed several common models that would have potential consideration in Loudoun County. A brief overview is warranted to understand these various models.

#### 4.4.1. THE CURRENT LOUDOUN COUNTY SYSTEM

The current Fire and EMS system is a public private-partnership between non-profit volunteer agencies and Loudoun County to provide Fire/EMS services. The system is comprised of multiple companies that own their own buildings and equipment, staffed primarily by volunteers and augmented with career staff. Funding is provided through philanthropy, County funds, *Two-For-Life*, and in the past, yearly proffers. Private companies provide the non-emergency ambulance transports.

The advantages of this system include integration within the community via the volunteers (neighbors helping neighbors), perceived lower system cost to the County (taxpayers) and maintenance of the volunteer tradition found throughout Virginia.

The disadvantages of this system include no central authority or command structure, system fragmentation, lack of uniform performance standards, lack of centralized planning, and decreasing availability of volunteers during a time of increasing demand in services.

#### 4.4.2. HOSPITAL BASED MODEL (RESCUE ONLY)

This type of model is generally a not-for-profit model. Staffing normally is full time career personnel. Funding is typically fee-for service, and generally includes some level of public subsidy.

Advantages of this model include that the hospital accepts accountability for service management. Hospitals generally have a wealth of medical and training resources to utilize as well as generally greater efficiency in areas such as purchasing, personnel, billing, etc.

Disadvantages include that the hospital may not have the capacity or expertise to manage an emergency services organization, and this model does not incorporate the fire components. Another disadvantage is the inability of the Board of Supervisors to respond quickly to citizen concerns. There is some question of whether hospitals will continue

providing EMS services since the historical method of reimbursement for hospital based providers from Medicare will be changing in 2001.

#### 4.4.3. PUBLIC-UTILITY MODEL

This type of model is typically created through a contractual relationship between the government entity and a provider, fire and/or EMS, often using a request for proposal (RFP) procurement process. Typically, a government entity establishes an authority that is accountable for overall performance of the system. The authority often owns the equipment, facilities, and vehicles and performs cost recovery. The authority selects a provider to staff the operations and meet the performance standards as set forth. In addition, this contractual relationship is created as a sole source provider – in which the provider *is* responsible for all fire and EMS emergency and non-emergency requirements.

One of the advantages of the public-utility model is that a county is responsible for setting operational standards and owning the physical assets; the responsibility for operations and employees remain with the contractor. Public-utility models are generally held to high performance standards that are measurable and have an established predictable cost structure. High performance standards allow a county to ensure that public-utility models meet the needs of the community. In case of contractor failure, the county already has the capital equipment and facilities to continue to provide services.

Disadvantages of this type system include high cost and the limited ability to use volunteers. It can leave a county vulnerable in the event of a contractor failure in having sufficient management and field personnel to carry on the demands of the system.

#### 4.4.4. PRIVATE MODEL

In this model a county usually sends out a RFP and reviews the bids received to determine which provider can best meet the performance requirements contained in the RFP at the lowest cost. Generally the contract is a multi-year contract. Once the contract is awarded the private fire, EMS, or fire/EMS provider assumes the responsibility of supplying the equipment, personnel, etc. and providing the service.

Advantages include that a county does not have to worry about personnel, capital equipment, or day-to-day operational issues of the service. The county can “contract away” the management and personnel problems inherent in organizations.

Disadvantages include the inability of the oversight board to respond quickly to citizen complaints about the quality or acceptability of service. If the private provider does not make enough money they may simply cease operations and go elsewhere leaving the county in a void on how to fill the gap and provide the service. While tight contracts could minimize this disadvantage it would not totally eliminate it and usually results in higher costs. Another disadvantage is that the county would lose the good will and community spirit of the volunteer involvement. This is true for several of the examples cited.

#### 4.4.5. COUNTY OWNED AND OPERATED MODEL

In this model Fire/EMS and Emergency Management is a department within county government. The facilities and equipment are county owned and personnel are county employees.

Advantages of this model include that the oversight board can determine and ensure the level of services offered: a) they can be responsive to the concerns and wishes of the citizens, b) they can maintain fiscal oversight to ensure efficiency in spending county funds, and c) they can ensure integration with other county services and they can ensure services will always be available where and when they are needed.

Disadvantages of this model include having the oversight board bearing the brunt of any dissatisfaction with or within the service as well as having to deal with multiple demands from various county departments for resources. Other disadvantages include responsibility for any unanticipated expenses such as the loss of an ambulance or fire apparatus.

### 4.5. ASSUMPTIONS USED IN THE LOUDOUN COUNTY MODEL DEVELOPMENT

In developing the Loudoun County model, EMSSTAR made a series of assumptions based on data, interviews, history and tradition, stakeholder input, available resources, future planning, growth predictions, changing demographics, risk profile, system demands, community expectations and perceived values of Loudoun County stakeholders. Additionally, EMSSTAR drew from the current professional experiences and expertise of its team members. EMSSTAR has conducted numerous local, regional, state, national, and international assessments. EMSSTAR team members currently hold positions in dynamic fire, EMS and emergency management organizations. This enhances EMSSTAR's in depth understanding of current best practices across the country and the underlying foundations of successful fire, EMS and emergency management organizations. The basic assumptions for the Loudoun County system are as follows:

1. Service to the citizen is paramount.
2. Volunteers are essential to the system and merit ongoing support by the County.
3. Loudoun County Government has the authority and responsibility to ensure the delivery of Fire/EMS and Emergency Management service for its citizens.
4. Fire/EMS and Emergency Management will continue to be a combination career/volunteer system.
5. The ability of volunteers to meet increased service demands may not keep pace with growth.
6. Effective communications among Fire/EMS and Emergency Management agencies in the County is critical.
7. There will be increased reliance on fiscal support from the County.

8. As more tax dollars are used to fund the system there will be increased fiscal accountability.
9. There will be increased performance accountability.
10. System operation changes should be data driven.
11. The County should take advantage of all system resources.
12. With increased demand for system resources, the system will require increased funding and more efficient utilization of existing resources.
13. There needs to be one final authority for system decision-making.
14. County hospital resources are inadequate to meet current and future needs.
15. The County has the responsibility for and will exert authority for strategic planning and implementation, including facilities.
16. The system model will be predicated on performance measures.
17. The system model will be in compliance with federal, state and local laws and regulations.
18. There will be significant attention to the recruitment, development and retention of human resources.
19. The County population and fiscal growth will continue at current rates for the foreseeable future.
20. The County has the authority to establish tax districts to fund Emergency Services.

## 5. THE LOUDOUN COUNTY PROPOSED MODEL

### 5.1. THE VISION

The vision of EMSSTAR for the Loudoun County Board of Supervisors is the provision of an integrated Fire, EMS and Emergency Management system to meet the needs of the citizens and visitors of Loudoun County. This integrated system will have as its foundation a combination of volunteer and career personnel working within predetermined performance standards and protocols. The design and implementation of this new entity will be based upon the foundation of existing resources and system data. The system will be dynamic, responsive, cost-effective and caring. It will be sensitive to the changing needs and explosive growth of Loudoun County and yet retain and strengthen the County's heritage and traditions of community service.

### 5.2. THE MISSION

The Mission of the Loudoun County Department of Fire, EMS and Emergency Management is the protection of life, property and the environment through the delivery of effective and efficient fire protection, emergency medical services and emergency preparedness programs.

### 5.3. MODEL ATTRIBUTES

The Loudoun County Model is based on the appropriate development and utilization of system attributes or components. These attributes are universal in successful systems and include areas such as regulation and policy, resource management, human resources, finance, medical direction, medical facilities, trauma systems, communications, response performance, data and evaluation, operations and transport, public information and education, fire prevention, training, specialized services, etc. The attributes break the system down into components and allow system managers to ensure that all the appropriate pieces are in place to ensure maximum system performance and efficiency. For example, the regulation and policy component assures that authority exists to carry out the mission, authority is in place to manage the system and policies are in place to ensure uniform implementation. The various attributes are discussed in greater detail below.

### 5.3.1. REGULATION AND POLICY

- ◆ To provide Fire/EMS and Emergency Management services in Loudoun County, the Loudoun County Fire and Rescue Department (the Department) will be formally established. The Department will consist of all existing volunteer fire and rescue companies and all career personnel.
- ◆ The Loudoun County Administrator will appoint a Chief of Fire and Rescue (the Chief) who will have overall authority and responsibility for the provision of Fire, EMS and Emergency Management services. The Chief's authority will be extended to all managerial and operational aspects of volunteer and career services in the County. Organizationally, the Chief will report to the County Administrator.
- ◆ The Board of Supervisors will appoint an advisory commission that will be known as the Fire, Rescue and Emergency Services Advisory Commission. It will be comprised of at least one citizen, one volunteer fire chief, one volunteer rescue chief, the system medical director, and the Chief, Loudoun County Fire and Rescue, who will be a non-voting. This Commission will advise the Chief in the operation of the Department and the development and implementation of policies that impact the entire County. The Commission will be given the same status and support as other advisory commissions within the County.
- ◆ The Department will apply for and acquire a single EMS License from the State Office of EMS that is representative of the unified and collaborative efforts of the County.
- ◆ The County Administrator will hire and appoint a County EMS Medical Director to provide operational medical control and oversight for all EMS services in Loudoun County.

### 5.3.2. RESOURCE MANAGEMENT

- ◆ The Department will create and maintain a centralized inventory of all fire, EMS and emergency management equipment, vehicles (other than personal vehicles) and personnel resources involved in emergency and non-emergency response to fire, EMS and emergency management incidents.
- ◆ Based on performance standards, the Chief will develop and maintain a centralized resource management plan that addresses needs assessment, planning, acquisition, utilization, deployment, maintenance, etc. for facilities, vehicles, equipment, and personnel.
- ◆ A water supply program will be in place to assure continuity of fire flow for all areas of the County.

### 5.3.3. HUMAN RESOURCES

- ◆ The system will continue to use a combination of volunteer and career personnel to deliver fire and EMS services.

- ◆ The recruitment, retention, including incentives, and development of volunteers will have a higher priority.
- ◆ Job descriptions, titles, and qualifications will be developed that are consistent between volunteer and career personnel.
- ◆ A standard chain of command will be established for all aspects of departmental operations.
- ◆ Within the career service, personnel classifications will be established such that ranks are equivalent and allow for the lateral transfer between department divisions at the direction of the Chief.
- ◆ Sufficient human resources will be available to meet the performance standards of the Department.

#### 5.3.4. FINANCE

- ◆ There will be accountability for all funds to provide Fire, EMS and emergency management in Loudoun County.
- ◆ Uniform accounting procedures will be established for all organizations in the Department.
- ◆ The Department will provide staff support to assist volunteer fire and EMS companies in matters related to financial accounting.
- ◆ The County will assume financial responsibility for operational and capital expenses for the system.
- ◆ There will be a tax district(s) in the County to create revenue to fund the operation and capital budgets of the Department.
- ◆ The County will consider all possible revenue sources to support a County system.

#### 5.3.5. MEDICAL DIRECTION

- ◆ There will be at least a 0.5 Full Time Equivalent (FTE) County Medical Director.
- ◆ The County Administrator will select the Medical Director.
- ◆ The Medical Director will report primarily to the Chief and secondarily to the County Administrator.
- ◆ The Medical Director will meet the minimal qualifications as described in standards by The National Association of EMS Physicians.
- ◆ The Medical Director job description will be consistent with that described by National Association of EMS Physicians.



- ◆ The Medical Director, in conjunction with the Chief of Fire and Rescue, will have the responsibility and authority for all clinical aspects of the EMS system including scope of service, clinical protocols and procedures, quality improvement matters of EMS personnel performance and resource development.
- ◆ The Medical Director will be provided with an appropriately equipped vehicle to respond to critical EMS and fire scenes.
- ◆ The Medical director will oversee the process of direct “on line” medical command.

### 5.3.6. MEDICAL FACILITIES

- ◆ The County, in conjunction with local health care facilities and appropriate planning groups, will ensure that there are sufficient medical facilities available to meet the current and projected needs of its’ citizens.
- ◆ Current and projected needs will include analysis of special populations such as the elderly, the young and such specialized needs as major burns, multiple traumas (both adult and pediatric) and other patient subsets.
- ◆ The County Medical Director, in conjunction with the medical community in the County, as appropriate, will develop and implement pre-hospital management and destination protocols.
- ◆ Standard operating procedures will be developed, implemented and disseminated for the conditions of emergency department bypass, intensive care unit bypass and other conditions that effect EMS destination. Methodology for the timely on-line communication of such conditions and procedures for EMS units under these conditions will be developed and implemented.

### 5.3.7. TRAUMA SYSTEM

- ◆ The Department will develop, implement and maintain policies and procedures related to the pre-hospital management of trauma victims of varying severity.
- ◆ The Department will maintain ongoing affiliations with the regional resource center to facilitate effective care of its patients. Such an affiliation agreement will address issues such as quality improvement, continuing education and countywide preventive initiatives.
- ◆ The Department will maintain transportation plans regarding the evacuation of trauma victims to appropriate facilities under various conditions of locale, weather, traffic, patient numbers and clinical situations.
- ◆ The Department as part of its information system will maintain a registry of trauma cases within Loudoun County.



- ◆ The Department as part of its public education efforts will maintain on going initiatives related to injury prevention within its own system and within the community.
- ◆ The Department will conduct periodic staff education related to trauma care.
- ◆ The Department will advocate for responsible public action, ordinances, laws and other initiatives directed toward reducing trauma related morbidity and mortality in Loudoun County.

### 5.3.8. COMMUNICATIONS

- ◆ A functional communication system is essential for effective Fire/EMS/EM operations. The system will have the capability to optimize the balance between response time reliability and efficient use of resources. It will support communications between all system stakeholders and provide countywide coverage. It will have redundant capabilities and the capacity to handle peak demand and disaster responses.
- ◆ Field staff and telecommunicators will be trained to use the system efficiently. Dispatch personnel will additionally be trained in emergency medical dispatch, pre- arrival instructions, customer service and medical referral procedures.
- ◆ The system will be ergonomically friendly.
- ◆ The system will provide private and secure communications.
- ◆ The system will support information management and data collection.
- ◆ The Communication Center will be a complete medical resource facility. Medical information and care will begin at the time of the call. A host of services will be provided that are beyond the traditional role of responding emergency personnel (e.g. centralized domicile CO detector services, follow-up on non-transported responses).
- ◆ The communication system will take full advantage of evolving technologies (e.g. GPS, CAD and satellite communications).

### 5.3.9. RESPONSE PERFORMANCE

- ◆ All emergency responses will consist of an appropriate response force composed of staff, vehicles, and equipment.
- ◆ The effective response force will at a minimum meet governing federal, state, and local standards (e.g. VA State EMS, applicable NFPA standards, VA-OSHA, and other applicable industry norms).

#### Examples:

- ◆ **Medical Emergency:** one first response apparatus (normally fire apparatus) with three persons, of which at least one is an EMT equipped with defibrillation capabilities; one ambulance with at least one paramedic and one EMT, or an equivalent combination.

- ◆ **Single-family Residential Fire** (hydrated area): two engines staffed with three personnel each, one ladder truck with at least four personnel; one command officer; and one safety officer, or equivalent combination, one ALS ambulance.
- ◆ Response performance standards shall be based on community expectations, best practices, and generally accepted industry standards.
- ◆ Response times will be computed and reported on a percentile basis.

**Examples:**

- ◆ **Medical Emergency:** first response apparatus within 5 minutes of dispatch; one paramedic within 10 minutes of dispatch, 90% of the time.
- ◆ **Single-family Residential Fire:** first engine company within 5 minutes of dispatch (based on flashover time-temperature curve); entire response force within 10 minutes of 911 call, 90% of the time.
- ◆ Differential response performance will be prescribed for urbanized and rural areas based on risk assessment.

**Example:**

**Table 1 – Differential Response Times**

Incident Type	Urban	Rural
Fire (First Due)	5 Minutes	10 Minutes
Fire (ERF)	10 Minutes	15 Minutes
EMS First response	5 Minutes	10Minutes
EMS (Paramedic)	10 Minutes	15 Minutes

- ◆ Response performance standards will include turnout times.

### 5.3.10. DATA AND EVALUATION

- ◆ There will be a comprehensive and fully integrated records management and reporting system, interfaced to the computer-aided dispatch system, which accurately and reliably records accepted data sets for all operational activities (emergency and non-emergency responses, inspections, and community/educational interventions).
- ◆ The records management system will record all data elements of the most current Virginia State EMS Reporting System, Virginia Fire Incident Reporting System, the Uniform Pre-hospital Data Set, the Health Insurance Portability and Accountability Act<sup>1</sup> (HIPAA), and such other data elements as prescribed by the County Medical Director and the Department.
- ◆ A comprehensive report will be completed on each incident and reported to a central records system and monthly reports will be provided to all companies.

- ◆ Wherever possible, technology will be utilized to capture and store data.
- ◆ The Department will regularly report system performance against established standards and publish those reports throughout the Department and to the County Administrators, Board of Supervisors and citizens.
- ◆ Data from the records management and reporting system will serve as a prime driver for organizational decision-making.
- ◆ There will be a LAN/WAN system that creates a connection between all Fire, EMS and administrative locations.

### 5.3.11. FIRE AND EMS OPERATIONS AND TRANSPORT

- ◆ Standard operating procedures will be established for all fireground and medical response activities.
- ◆ A minimum equipment list and positioning of apparatus will be established and implemented at all stations.
- ◆ All companies will adhere to minimum staffing levels.
- ◆ The second due company will respond with only the number of apparatus required to complete the minimum vehicle assignment requirement.
- ◆ All fire and EMS units will be identified as being staffed when minimum personnel are physically staffing a vehicle. The communications center will track staffed units. When a call is received, the first due company will be dispatched automatically. If the first due company does not have a staffed unit, the closest appropriate staffed unit will be immediately dispatched. This rollover time will be determined based on the well being of citizens, and not on the convenience of responders.
- ◆ All personnel will implement and follow a standard incident management system.
- ◆ Units will be dynamically relocated to temporarily equalize response capabilities during times when other units are committed to emergency incidents.
- ◆ An ALS unit and the closest engine will be dispatched on all life threatening incidents at all times.
- ◆ A minimum of first responder certification will be required for all fire personnel.
- ◆ Incident updates will be provided to the first responding units even if they are not the first due company on the incident.
- ◆ All equipment, particularly safety related equipment, will meet all safety standards.
- ◆ All personnel will wear appropriate levels of protective equipment while responding to and operating at any emergency incident.

- ◆ All personnel, including civilians riding on or in apparatus will be appropriately restrained.

### 5.3.12. PUBLIC INFORMATION AND EDUCATION

- ◆ A strong public information program will be in place to inform and educate the citizens of Loudoun County about the Department on an ongoing basis.
- ◆ Residents will have an accurate understanding of the type of emergency response available to them and the appropriate use of those services.
- ◆ Radio and television stations will routinely donate time and resources for Fire and Rescue public service announcements and documentaries.
- ◆ Informational videos and literature will be produced and distributed that highlights the Department.
- ◆ All personnel affiliated with the County Fire/EMS and Emergency Management system will be prepared to describe the system to citizens.
- ◆ A strong public education program will be in place to educate citizens and businesses in fire, injury and illness prevention.
- ◆ A school program will be in place to assure that every child in the school system has at least three formal courses or interactions in fire, injury, and illness prevention and response programs.
- ◆ The respective companies will represent the Department at all County and community functions.
- ◆ A formal injury prevention, facility inspection, and education program modeled after the fire prevention program will be implemented to reduce injuries in the County.
- ◆ The public education program will be utilized to recruit volunteer personnel.

### 5.3.13. FIRE PREVENTION

- ◆ A totally integrated automated inspection and permit program will be in place for all inspections and fire prevention permits.
- ◆ A standard inspection schedule will be in place that describes the frequency of inspections by type of occupancy.
- ◆ A system will be in place to inform fire prevention personnel of buildings in the plans review process, special occupancy proposals, and occupancy permit approvals.
- ◆ A system will be in place to notify company personnel of upcoming buildings, and of issuance of final certificate of occupancy permits.
- ◆ A specially trained juvenile investigator will coordinate the Juvenile Fire Setter prevention program.

- ◆ Formal policies will be in place that addresses the law enforcement activities of sworn fire investigators.
- ◆ Follow-up investigations will be completed in a timely fashion to assure the continuing high conviction rate.
- ◆ A fire incident reporting system will be in place and will be mandatory for all incidents.
- ◆ Clerical support will be in place to assure that all documentation is processed in a timely fashion.
- ◆ All fire investigators will have communications equipment that assures their safety while out of their vehicles on emergency responses and investigations.
- ◆ A database will be established that tracks all properties to be inspected and changes in use so as to establish a history of the buildings in Loudoun County.
- ◆ A formal pre-plan process will be in place for all target hazards in the County. The preplans will be developed and updated by the district fire companies.

#### 5.3.14. TRAINING

- ◆ Minimum training standards and continuing education requirements will be in place for all Fire, EMS, and Emergency Management personnel in the Department.
- ◆ Loudoun County will provide entry level, advancement and maintenance training for all personnel.
- ◆ The Department will maintain a career development program for all career and volunteer personnel.
- ◆ A competency based screening program will be developed to determine the length and content of training for new volunteers and employees.
- ◆ The Department will have sufficient training staff to train all volunteer and career personnel on all required and desirable topics.
- ◆ The Department will assure uniformity of minimum training standards for delivery to career and volunteer personnel.
- ◆ A formal program will be in place to regularly evaluate competency of personnel and quality of education and resources. This should drive continuing education and future course development and delivery. Personnel should be periodically evaluated by formally trained and experienced fire, EMS supervisors and trainers in all relevant incident/patient and operational functions (i.e., driving, communicating, etc.) as well as firefighting, rescue and EMS competencies
- ◆ As assessment will be completed to determine the minimum expectations for entry-level competencies.

### 5.3.15. WATER SUPPLY

- ◆ The Department will identify fire protection water demands and shall plan and develop a system to provide for those demands based on defined and specified fire scenarios developed for rural and suburban areas.
- ◆ System design shall recognize target hazards and occupancies that exceed routine fire flows.
- ◆ A minimum system design will consider maximum daily demand and fire flow requirements.

### 5.3.16. EMERGENCY MANAGEMENT

The integrated emergency management function provided by the Department will include responsibility for the prevention, mitigation, response and recovery to manmade or natural disaster events that require the effective coordination of local, state and federal resources. Specific functions include the administration and coordination of the emergency operations center, development and maintenance of the emergency operations plan, identification and coordination of emergency management information.

A hazards analysis of the County will be performed and updated annually. This enables decision-makers to set priorities and goals for planning and training and to effectively allocate resources on a day-to-day basis and most importantly during a disaster.

#### 5.3.16.1. SPECIALIZED SERVICES

##### 5.3.16.1.1. MASS CASUALTY INCIDENTS

A plan will be established with defined responsibilities for each element of a mass casualty incident. At a minimum, the plan will provide for command and control. Included is a coordinated system of medical resources available to effectively provide for the treatment and transportation of patients to appropriate medical facilities. Plans will be reviewed and tested on a periodic basis.

##### 5.3.16.1.2. HAZARDOUS MATERIALS

A program will be established that provides for an effective response to hazardous materials incidents including recognition and isolation of the event.

##### 5.3.16.1.3. SEARCH AND RESCUE

Capabilities will exist to provide for the search and rescue potentials present within the community.

#### 5.3.16.1.4. TERRORISM/WEAPONS OF MASS DESTRUCTION

A plan will be developed that recognizes the role of the emergency services program in the response to a local or regional, actual or threatened terrorist event or release of a weapon of mass destruction.

A response would use the Incident Command System (ICS) and Unified Command, in cooperation with the Federal Bureau of Investigation (FBI) to ensure that all responders and their support assets are coordinated for an effective and efficient response that is necessary to save lives and mitigate property and infrastructure damage.

A terrorism hazard analysis will be performed to identify the vulnerability and risk to sites in the region.

Funding will be sought from Federal granting agencies for personnel training, equipment purchases and pharmaceuticals.

#### 5.3.16.2. EXTERNAL AGENCY RELATIONSHIPS

Appropriate agreements will be developed that provide for assistance to emergency events from external agencies. These agreements provide for the defined relationships, responsibilities and situations in which external agency assistance is required or provided. Inclusive within the agreements are the reciprocal relationships that may be required. Types of external agency relationships may include:

- ◆ Mutual Aid Agreements – Defined as inter-governmental agreements with neighboring jurisdictions that provide resources when available internal community capabilities have been exhausted.
- ◆ Automatic Aid Agreements – Defined as agreements in which response to an emergency event is predicated on closest available resource irrespective of jurisdictional boundaries.
- ◆ State or Regional Assistance- Specialized functions provided by an external agency to local government that may be required on an individual non-routine basis.
  - Hazardous Materials
  - Trench Rescue
  - Confined Space Rescue
  - Urban Search and Rescue
  - Disaster Medical Assistance Teams
  - Response to Terrorism and Weapons of Mass Destruction
  - ATF Arson Task Force

- ◆ Cooperative agreements that specifically define the relationship between the local agency and those organizations with which the agency routinely interacts including integrated communications capabilities.
  - Air Medical
  - Hospitals
  - Tertiary Care Facilities

### 5.3.17. INTEGRATION

As the Loudoun County Fire/EMS and Emergency Management system matures it will provide a unique opportunity for system integration. A mature system will have the potential to provide:

- ◆ **More appropriate acute health care management.** For example, as a patient with acute heart attack presents to providers, information could be faxed to the responding ambulance under medical direction for specific pre-hospital management. This might include pre-hospital administration of thrombolytic agents or immediate transport to a facility with cardiac catheterization capability. It might also include pre-hospital medical management through on-line video conferencing with a medical facility for alternate health care decisions.
- ◆ **Chronic care surveillance.** Long term monitoring of conditions such as hypertension, diabetes and chronic obstructive lung disease could be performed with the goals of more appropriate use of acute hospital facilities and a decrease in preventable emergency responses. Early identification of chronic disease complications could also be accomplished.
- ◆ **Early identification of risk factors.** Early identification could result in more timely intervention from social services, protective services or other agencies.
- ◆ **Surveillance of nuclear, biologic and chemical weapons of mass destruction and terrorism.** Early identification of a sentinel case by EMS personnel is the most sensitive monitor available in the community.
- ◆ **Prevention.** Preventive measures specific to the County could be established. For example, if drug abuse and suicide are determined to be major health care problems in the area, then preventive services could be provided for populations at risk for these problems.
- ◆ **Prevention of chronic disease.** Interventions such as vaccination programs for the elderly or other underserved populations could be provided by the mature system.



## 6.ACTION REQUIRED

- ◆ Task 1 is the development of a Fire/EMS and Emergency Management model for Loudoun County and is the foundation of the project, and is complete. The model will drive the content of the remaining tasks. Therefore, it is essential that the County Board of Supervisors take definitive action on the model before EMSSTAR can proceed to subsequent tasks.

## A. FEE FOR SERVICE ATTRIBUTE

### A.1 Fee for service Attribute

One component of successful organizations including fire and rescue is the financial component. Loudoun County emergency medical system rescue (ambulance) services generate revenues through a variety of methods—the proffer system and through local fund raising activities like bingo. The significant growth of the County continues to add revenue, through taxes, to the County coffers but of course, the expenses to operate the infrastructure are rising as well. In light of the changes to the proffer system and the increasing demand of the rescue services, future funding will be an increasingly important component to successful operations.

While there are a variety of funding methods currently used in Loudoun County, a fee for service method has not been utilized. EMSSTAR understands that the rescue squads, the County Board of Supervisors and the citizens are reluctant to entertain this method of cost recovery. It also appeared that ambulance fee-for-service methods are not well understood. It was generally thought that although emergency services should be considered an essential community service, they should remain funded through charitable contributions and subsidies.

For illustrative purposes, we have prepared two models of cost recovery using a fee-for-service method. It should be understood that Medicare, Medicaid and many insurers pay for a portion or all of the cost associated with medically necessary ambulance service. In most cases, either an employer or the individual has already paid for this type of coverage through their premiums. Consequently, one could argue that use of taxes as a source to cover this portion of the expense is increasing the cost on any individual user of the service. Further, it should be noted that in many parts of the country, fee-for-service is a component of cost recovery for ambulance service. In each model listed, it is important to note that any deductibles, especially with governmental payers, the patient is responsible for paying the ambulance service. While fee-for-service may not be acceptable to Loudoun County at this time, EMSSTAR would be remiss in our responsibilities if we did not make the Board of Supervisors aware of the option.

### A.2 Model 1

The first model assumes that on the projected 17,000 ambulance transports that 85% would be classified as Basic Life Support (BLS) and 15% would be classified as Advanced Life Support (ALS) according to the Balanced Budget Act of 1997<sup>2</sup> definitions. In this model, based on the proposed new fee schedule of the Health Care Financing Administration<sup>3</sup>, (HCFA) annual payment of \$3,425,840 would be received. This includes a 20% discount, which includes bad debt and contractual allowances for payers. It does not include the cost of generating an invoice or collection.

**Table 2 – Model 1 - Primary BLS Response**

**Volume = 17,000**

Rates	Rate	%	%/Vol	Transport Revenue
BLS Rate	\$158	10%	1,700	\$268,600
BLS Emergency	252	75%	12,750	\$3,213,000
ALS-1 Non-emergency	189	5%	850	\$160,650
ALS-1 Emergency	300	5%	850	\$255,000
ALS-2 Emergency	433	5%	850	\$368,050
Mileage (\$5x10miles)	50		17,000	\$17,000
Revenue				<b>\$4,282,300</b>
Discounts		20%		\$856,460
Rev less Discounts				<b>\$3,425,840</b>

## A.3 Model 2

The second model assumes that on the projected 17,000 ambulance transports that 40% would be classified as BLS and that 60% would be classified as ALS. Similar to Model 1 above, the discounts and cost of generating an invoice are the same.

**Table 3 – Model 2 - Primary ALS Response**

**Volume = 17,000**

Rates	Rate	%	%/Vol	Transport Revenue
BLS Rate	\$158	15%	2,550	\$402,900
BLS Emergency	252	25%	4,250	\$1,071,000
ALS-1 Non-emergency	189	20%	3,400	\$642,600
ALS-1 Emergency	300	25%	4,250	\$1,275,000
ALS-2 Emergency	433	15%	2,550	\$1,104,150
Mileage (\$5x10miles)	50		17,000	\$17,000
Revenue				<b>\$4,512,650</b>
Discounts		20%		\$902,530
Revenue less Discounts				<b>\$3,610,120</b>

Assumptions: Bad debt, payor discount and cost of billing reductions should be considered (estimates of cost =20% of revenue).

In summary, the decision to use a fee-for-service method of cost recovery should be evaluated to determine if this is a method that should be given further consideration. Through this evaluation, historical, political, cultural and financial considerations must be taken into account.

## List of References

The following references were used in the preparation of this document:

- ◆ Countywide Transportation Plan 1995
- ◆ Design Guidelines for Major Roadways County Wide
- ◆ Revised Countywide Transportation Plan
- ◆ 1999 VDOT Daily Traffic Volumes for Loudoun County (LC) including vehicle classification estimate
- ◆ The local and regional economic impacts of Dulles Airport
- ◆ Dulles Airport Air Traffic Statistics
- ◆ Loudoun County Revised General Plan (Nov. 14, 2000)
- ◆ Loudoun County General Plan 1991-2010
- ◆ Report: Impact of potential Proffer loss/volunteer Fire and Rescue Companies
- ◆ Loudoun County Board of Supervisors Action Item: Proffers for Annual Fire and Rescue Operating Costs
- ◆ EMS and Hospital Issues (Diversion/Reroute
- ◆ Fire and Rescue Policy: Distribution of Fiscal 2001 County Contributions
- ◆ Loudoun County EMS Agencies: numbers of Providers
- ◆ Loudoun County EMS Advisory Committee: Policies and Procedures: Peer Review Committee (1988)
- ◆ Loudoun County EMS Advisory Committee SOP Technician disposition pending peer review of Alleged Infractions
- ◆ Northern Virginia EMS Council By Laws
- ◆ The Greater Metropolitan Washington Area Fire/Rescue Mutual Aid Operational Plan
- ◆ Pin Maps: BLS Calls by month
- ◆ Pin Maps: ALS Calls by month
- ◆ VA DOH State EMS Reporting system
- ◆ VA DOH State Recertification/ Continuing Education system
- ◆ Loudoun County ALS Protocols

- ◆ Loudoun County Emergency Operations Plan
- ◆ Loudoun County Provider roster by name title, and certification date
- ◆ Loudoun County Fire and Rescue Incident Summary Jan - Oct by date time activity, service
- ◆ Three Volume FY 2001 Loudoun County Fiscal Plan
- ◆ Fire and Rescue services Chapter of fiscal plan
- ◆ Budget report for each services
- ◆ Major Business Employers for Loudoun County
- ◆ Fortune 500 Articles "The Best Cities for Business"
- ◆ 1999 Annual Growth Summary
- ◆ 1999 Annual Update Demographic Revenue and Expenditures Models and 20 Year Growth Scenarios
- ◆ Roster: Department Vehicles by year and make and type
- ◆ Zoning Ordinances for Loudoun County
- ◆ Guide to Services in Loudoun County
- ◆ Virginia EMS/Fire Code
- ◆ CD: Digital Data of Loudoun County including 1:2400 scale parcels soils flood plains drainage edge of pavements water bodies, airport noise contours, urban growth rates, including Arc Explorer software. CD: Loudoun County SA Data: Hydrants Water , Valves
- ◆ CD: Fire First Due, Fire Stations, Rescue First Due, Towns, Road Casing, Road Center Line, street names, address in data base files
- ◆ Maps: Proposed Land use
- ◆ Maps: Generalized Planned Land Use
- ◆ Maps:" Future Conditions Influencing Fire and Rescue Services in Loudoun County
- ◆ Assessment of the Loudoun County Fire and Rescue System: The McManis Report, 1984
- ◆ Draft report of the Fire and Rescue Strategic Plan Advisory Committee: 1997

<sup>1</sup> Health Insurance Portability and Accountability Act of 1996. This is a federal law passed in 1996. The accountability part of the law was written with two goals: 1) to save money by simplifying the electronic transfer of administrative and financial information within the health care industry and, 2) to protect the security and privacy of health information. <http://www.hcfa.gov/regs/hipaacer.htm>

<sup>2</sup> Balanced Budget Act of 1997. The Balanced Budget Act of 1997 is administered by HCFA and authorized establishment of a new ambulance fee schedule. This new fee scheduled was created through a process called “negotiated rule making” that is now complete and advancing to implementation. <http://www.hcfa.gov/regs/budget97.htm>

<sup>3</sup> Health Care Financing Administration. The Federal agency responsible for the administration of the Medicare and Medicaid programs of which, both have procedures for ambulance billing. <http://www.hcfa.gov/>